ANNUAL REPORT

1962

LAKEVIEW WATER POLLUTION CONTROL PLANT

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OWRC PROJECT NO. 59-S-43

LAKEVIEW WATER POLLUTION CONTROL PLANT

OPERATED FOR

THE CORPORATION OF METROPOLITAN TORONTO, TORONTO TOWNSHIP

AND THE TOWN OF PORT CREDIT

BY

THE ONTARIO WATER RESOURCES COMMISSION

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PREPARED BY

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LAKEVIEW WATER POLLUTION CONTROL PLANT

I HISTORY

The Lakeview Water Pollution Control Plant was officially opened on November 24, 1961 by the Honourable Fred M. Cass, Q.C., Minister of Municipal Affairs.

CORPORATION OF THE TOWNSHIP OF TORONTO

The Township of Toronto is located immediately west of Metropolitan Toronto on the north shore of Lake Ontario. The total acreage of the township is 69,272 acres; and the population is 65,000. The township was incorporated on January 1, 1850.

The entire township is serviced by both the Canadian National Railway and the Canadian Pacific Railway, with the interconnecting major and local truck lines and bus service available on all major highways. The community is also served by the St. Lawrence Seaway, and by several major international airlines for both passenger and freight service out of Toronto International Airport (Malton), which is located in the northeast section of the township. In recent years, many major industries have constructed large modern plants in the township and the township is fast becoming a centre of major industry in Ontario.

The township's water supply is provided from a modern water filtration plant located on the shore of Lake Ontario. The community is also served by five major sewage treatment plants which are located in various sections of the township.

THE MUNICIPALITY OF METROPOLITAN TORONTO

In the year 1953, the legislature of the Province of Ontario, by the enactment of the municipality of Metropolitan Toronto Act, R.S.O. 1960, established the municipality of Metropolitan Toronto. This legislation became effective on April 15, 1953, and provided for a federation of the following thirteen municipalities within the metropolitan area :

Township of East York
Township of Etobicoke
Village of Forest Hill
Town of Leaside
Village of Long Branch
Town of Mimico
Town of New Toronto
Township of North York
Township of Scarborough
Village of Swansea
City of Toronto
Town of Weston
Township of York

Under this legislation, the local municipalities retain their individual autonomy with respect to local matters and the metropolitan council is responsible for the provision of metropolitan services.

Generally speaking, the metropolitan corporation has responsibility with respect to assessment, water supply, sewage disposal, air pollution control, arterial highways, planning, transportation, homes for the aged, financing of Children's aid societies and education, civil defence, administration of justice, metropolitan police, metropolitan parks, licensing.

The membership of the metropolitan council is divided equally between the City of Toronto and the suburban municipalities. It includes the heads of the twelve suburbs and twelve aldermen. A chairman is elected by the council.

THE CORPORATION OF THE TOWN OF PORT CREDIT

The Town of Port Credit is located on the north shore of Lake Ontario and situated around the mouth of the Credit River. The total acreage of the town is 666 acres: and the population is 6,564. The town was incorporated on January 1, 1961.

Although modern transportation has placed Port Credit into "suburbia", in relation to Metro Toronto, it still retains its autonomy. The community has several major industries, including the St. Lawrence Starch Company Limited, an independent Canadian Company, Texaco Refining (Canada) Limited and Dominion Metalwares. Of particular pride to the community, among its many recreation facilities, is the new memorial arena.

The town water supply is provided by a modern water filtration plant located on the shore of Lake Ontario. The community's sewer system is connected directly to the new Lakeview Plant.

II PLANT DESIGN

A. Influent Works

The waste water enters the plant through a 48-inch diameter sewer, passing into the influent chamber. The chamber is equipped with a bar screen to remove large objects which may be found in the sewer system. From this point the flow discharges to the aerated grit chamber, where the velocity of flow is reduced sufficiently to allow grit and detritus material, which may damage plant machinery, to settle out. The air introduced in the chamber produces a roll which allows grit to settle out, while keeping the organic material in suspension. The clam shell bucket hoist removes the settled grit.

From the grit chamber, the flow passes through a comminuting device which screens and shreds the larger particles to a size suitable for handling in the treatment units. From this point, the flow is discharged to the primary tanks.

B. Primary Settling

These two rectangular tanks are designed to provide a detention period, allowing the heavier solids to settle out and for removal of surface scum and grease.

The tanks are divided into two sections and equipped with longitudinal sludge collectors which serve as skimming mechanisms for removal of surface material and for transferring the settled sludge to hoppers located at the end of the tanks. The sludge hoppers are equipped with cross collector mechanisms which draw the sludge to a central point. The sludge and the surface material is drawn off and pumped to the primary digester.

These tanks are designed to provide a detention period, sufficient to allow removal of approximately 30-35% of the heavy organic material. The remaining finely divided, suspended and dissolved materials are removed in the secondary biological stages.

The settled waste water flows over the effluent weirs and discharges into the aeration tanks.

C. Aeration

The flow upon entering these two, three pass, aeration tanks undergoes another detention period which provides the biological environment required to remove the finely divided, suspended and dissolved organic materials remaining in the flow.

The settled sludge (activated sludge), from the final settling tanks, is recirculated back to the aeration tanks, and mixes with the incoming effluent from the primary tanks. This mixed liquid (mixed liquor) is then aerated by air, which is supplied from compressors. The air supplied provides the oxygen requirements of the biological communities of aerobic micro-organisms (sludge floc) and also produces a roll which prevents settling in the tanks. The activated sludge which is returned acts as the vehicle for the bacteria which in turn oxidizes the organic material contained in the water.

The mixed liquor then passes into the final settling tanks where the activated sludge is settled out.

D. Final Settling

The three rectangular final settling tanks provide a detention period to allow remaining solids to settle out. It is from the activated sludge, settling out in these tanks, that a continuous environment is provided for the maintenance of the floc in the aeration section.

These tanks are equipped with two longitudinal sludge collectors which transfer the sludge to the hopper, located at the end of the tank, and cross collectors transfer the sludge from the hopper to a central point from where pumps transfer it back to the aeration tanks or to waste. After final sedimentation, the effluent flows through a Parshall flume which measures the flow leaving the plant and then to the chlorinating man hole.

E. Digestion

The digestion in this plant is performed in two stages called primary and secondary digestion.

The sludge from the primary clarifiers is pumped, with excess activated sludge, to the primary digester. In the absence of air, and a regulated temperature of 90 degrees Fahrenheit, the decomposing or digestion process begins. Constant agitation within the tank ensures overall treatment.

The raw sludge is broken down by anaerobic bacterial action and, when thoroughly digested, is a thick, black, odourless liquid.

The secondary digester receives the digested material from the primary and completes the process. The secondary digester is not agitated, but is allowed to be quiescent. The supernatant is decanted and returned to the treatment process.

Sludge gas (principally methane), formed during the process, is used as a fuel for the heat exchangers and boiler, supplying heat to the digesters and buildings. The standby fuel is oil.

F. Chlorination and Equipment

The chlorinator, located in the blower building, is equipped to deliver up to two thousand pounds of chlorine per day. Chlorination is carried out in the effluent outfall to ensure disinfection.

Located in the raw sludge pumping station are two raw sludge pumps and a scum pump, delivering the settled primary sludge and scum material to the digester. Located in the return sludge pumping station are four activated sludge return pumps and a scum pump. Located in the digester control building are two sludge transfer pumps and two recirculating pumps.

III TECHNICAL DATA

Grit Chamber

Dimensions of the chamber are 14 ft. x 15 ft. 5 in. x 11 ft. deep, with a volume of 2,375 cubic feet, (14,800 gallons), and a design flow detention period of 4.26 minutes.

Primary Clarifiers

The two clarifiers, each 87 ft. x 32 ft. x 12 ft. deep, have a combined volume of 66,900 cubic feet, (417,000 gallons). Design detention is 2.0 hours. The surface settling rate is 900 gallons/sq.ft. of tank/day, and the weir overflow rate is 13,000 gallons/sq. ft. of weir/day. The longitudinal collector speed is 2.0 feet per minute and the cross collectors are 4.0 feet per minutes.

Aeration

The two rectangular three pass tanks are each 144 ft. x 63 ft. x 14.3 ft. deep, with a combined volume of 250,000 cubic feet, (1,650,000 gallons). The aeration period at design flow is 7.9 hours, and with 25% return activated sludge is 6 hours. The air supply is 1.1 cubic feet per gallon.

Final Clarifiers

The three rectangular clarifiers are each 87 ft. x 32 ft. x 12 ft. deep, with a combined volume of 100,000 cubic feet (624,000 gallons). The design detention period is 3 hours. The surface settling rate is 600 gallons/sq.ft. of tank/day, and the weir overflow rate is 7,000 gallons/lin.ft. of weir/day. The speed of the longitudinal collectors is 1.0 ft. per minute and of the three cross collectors 2.0 ft. per minute.

Chlorination

The effluent pipe, approximately 2,000 feet long, doubles as a chlorine contact chamber and provides a detention period of 50 minutes.

Digestion

The digesters are each 65 feet in diameter, with a combined volume of 164,500 cubic feet. Their capacity is 3.28 cubic feet per capita, and loading is 2.3 lbs. of solids/cu.ft. of tank/month.

Equipment

The two large blowers each have a rated capacity of 3,900 cubic feet of air per minute and the small blower, 1,700 cubic feet, operating against a gauge pressure of 6.5 psi, with an overall total capacity of 11,500,000 cubic feet of air per day.

Located in the raw sludge pumping station are two raw sludge pumps, 50 gpm at 70 ft. TDH each, and a scum pump, 80 gpm at 70 ft. TDH. Located in the return sludge pumping station are four activated sludge return pumps, 600 gpm each, and a scum pump, 50 gpm. Located in the digester control building are two sludge transfer pumps, 150 gpm each, and two sludge recirculating pumps, 120 gpm each.

IV PLANT OPERATION

(A) HYDRAULIC LOADING

During the past year 1962 the Lakeview Water Pollution Control Plant treated a total of 740.9 million gallons of sewage. (see Fig. 1) This represents an average daily flow of 2.03 million gallons for the year or a per capita demand of 40 gpd based on the design population of 50,000 persons.

The maximum and minimum flows registered during the year occurred on November 12th (5.64 mg) and June 3rd (.967 mg) respectively. (see Table I).

Figure 2 is a probability graph showing the percent of time the flow is equal to or greater than a certain value. An examination of Figure 2 will show that 50% of the time the flow is equal to or greater than 1.6 mgd. It also indicates that the total design flow of 5 mgd is exceeded only for a very small percent of the time.

(B) GRIT REMOVAL

The total amount of grit removed in 1962 was 790 cu.feet. This represents 1.07 cu.feet of grit per million gallons of sewage treated. This value is low in comparison with similar installations in North America.

(C) PLANT PERFORMANCE

During the past year thirty-eight sets of samples were

obtained for laboratory analysis.

The results of these analysis indicate that the average B.O.D. and suspended solids loading for the raw sewage was 175.5 ppm and 274 ppm respectively. In other words the plant received on an average, 3562 pounds B.O.D. and 5562 pounds suspended solids each day.

Examination of figures 3 and 4 show that 50% of the time the B.O.D. and suspended solids loading of the raw sewage was equal to or greater than 145 ppm and 260 ppm respectively.

Figures 5 and 6 show the accumulative B.O.D. and suspended solids loading in pounds for the year.

There are two primary clarifiers having a total volume of 66,900 cu.ft. or 417,000 gallons. These two clarifiers provide a detention time of 2.0 hours at design flow. The average detention time for the average daily flow of 2.03 million gallons was 4.9 hours.

The average surface settling rate for 1962 was 360 gal/ sq.ft. of tank/day and the average weir overflow rate was 5300 gal/ lin.ft. of weir/day.

The primary clarifiers were designed to remove 30% and 60% of the B.O.D. and suspended solids based on the design flow and loadings. The results obtained in 1962 were 48.5% and 65%. (see figures 5 and 6). These results are very good for primary reduction.

Figures 3 and 4 shows the B.O.D. and suspended solids in the primary effluent to be less than 74 and 86 ppm 50% of the time.

The aeration section of the plant consists of two, three pass, aeration tanks. These tanks are so designed that step aeration or conventional activated sludge method may be used in treating the sewage.

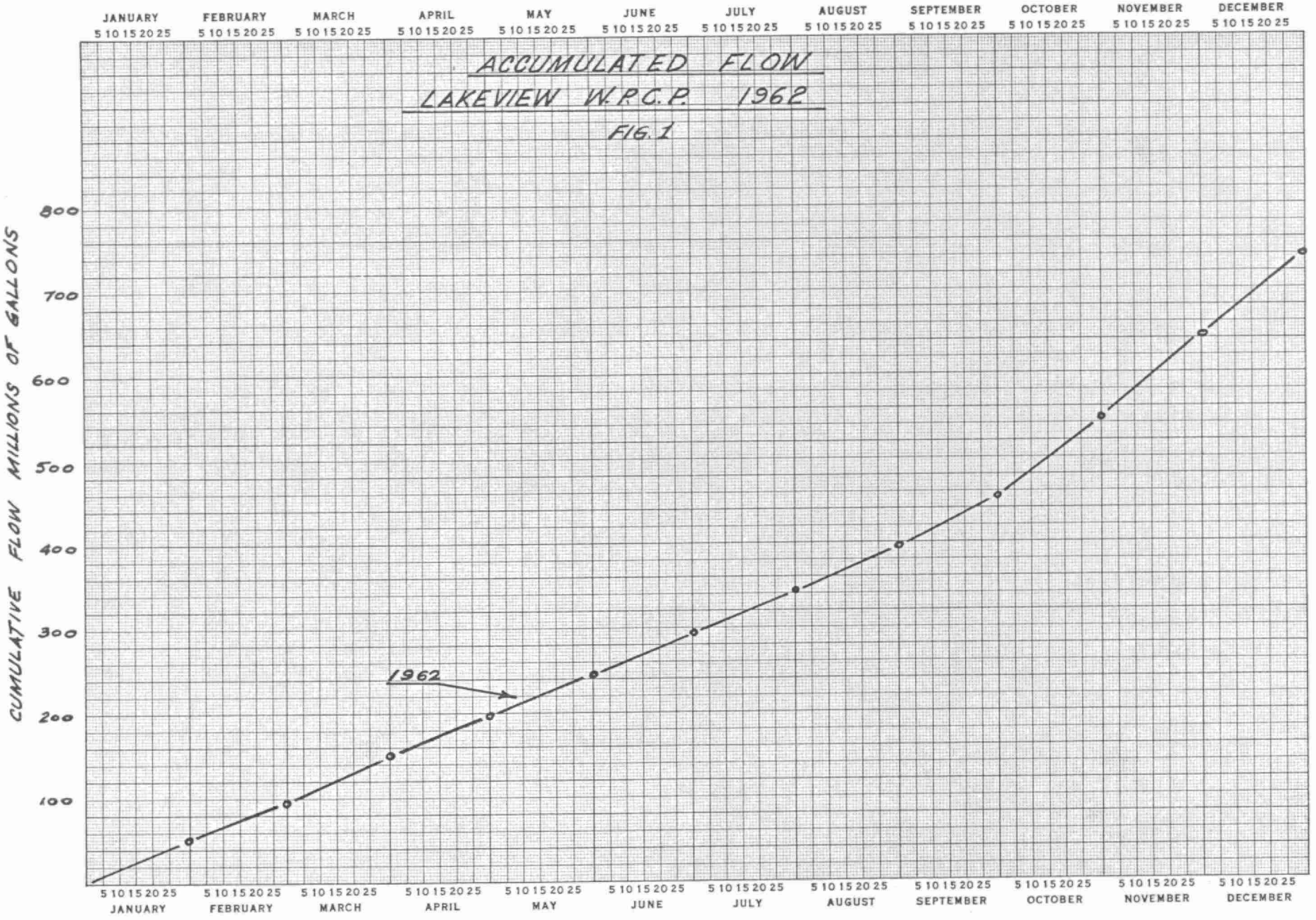
The average B.O.D. loading on the aeration section during the past year was 1704 pounds per day. The suspended solids in the aerator was 1555 ppm. The average B.O.D./suspended solids ratio was 13.5 pounds B.O.D. per 100 pounds mixed liquor suspended solids.

There are three final settling tanks having a total volume of 100,000 cu.ft. or 624,000 gallons. This provides a detention time of 3 hours at design flow. The average detention time in the final tanks during the past year was 7.5 hours. The average surface settling rate at design flow is 600 gal/sq.ft. of tank/day. For the average daily flow of 2.03 the average settling rate was 240 gal/sq.ft. of tank/day. The average weir overflow rate for the final clarifiers was 2800 gal/lin. ft. of weir/day during the year compared to the design flow rate of 7000 gal/lin.ft. of weir/day.

The plant was designed to provide a removal of 90% for both B.O.D. and suspended solids at concentrations of 225 ppm and 250 ppm respectively in the raw sewage. Figures 5 and 6 show the removal obtained during the past year to be 82.5% for B.O.D. and 86% for suspended solids. This represents an average removal of 3000 pounds B.O.D. and 4780 pounds suspended solids. The removals at design flow and concentrations would be 10,200 and 11,500 pounds B.O.D. and S.S. per day.

Figure 3 shows that 50% of the time the final effluent B.O.D. was equal to or greater than 16 ppm while figure 4 shows the final effluent suspended solids was equal to or greater than 36 ppm.

The OWRC objective that the B.O.D. and S.S. in the final effluent should not exceed 15 ppm is met 45% and 17% of the time - see Figure 3 and 4.


ACCUMULATED FLOW
LAKEVIEW W.P.C.P. 1962
FIG. 1
CUMULATIVE FLOW MILLIONS OF GALLONS
100
200
300
400
500
600
700
800
1962
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
5 10 15 20 25

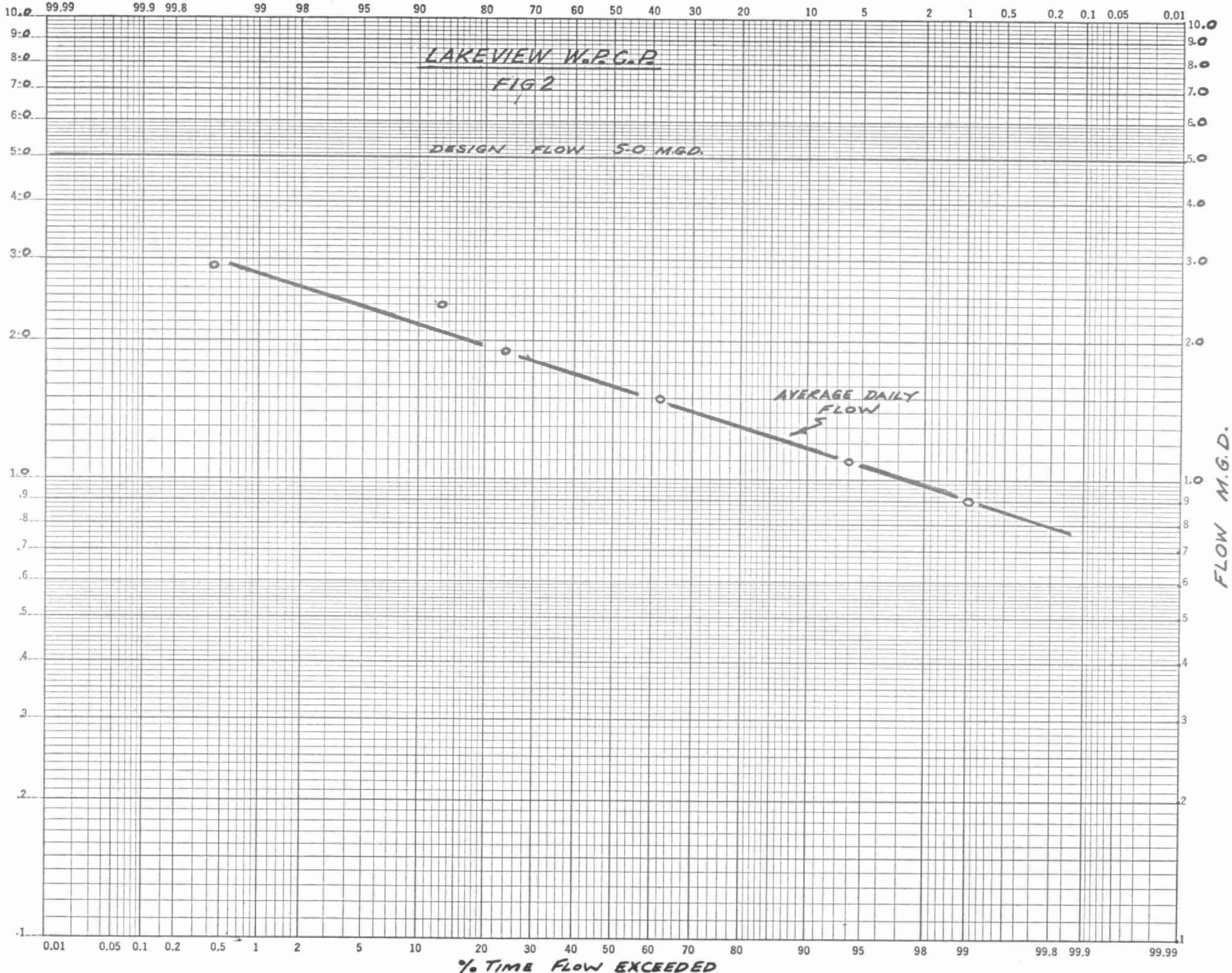

LAKEVIEW W.P.C.P.
FIG 2
DESIGN FLOW 5.0 M.G.D.
AVERAGE DAILY FLOW
FLOW M.G.D.
% TIME FLOW EXCEEDED
99.99 99.9 99.8 99 98 95 90 80 70 60 50 40 30 20 10 5 2 1 0.5 0.2 0.1 0.05 0.01
0.01 0.05 0.1 0.2 0.5 1 2 5 10 20 30 40 50 60 70 80 90 95 98 99 99.8 99.9 99.99
10.0 9.0 8.0 7.0 6.0 5.0 4.0 3.0 2.0 1.0 .9 .8 .7 .6 .5 .4 .3 .2 .1

TABLE I

Lakeview Water Pollution Control Plant

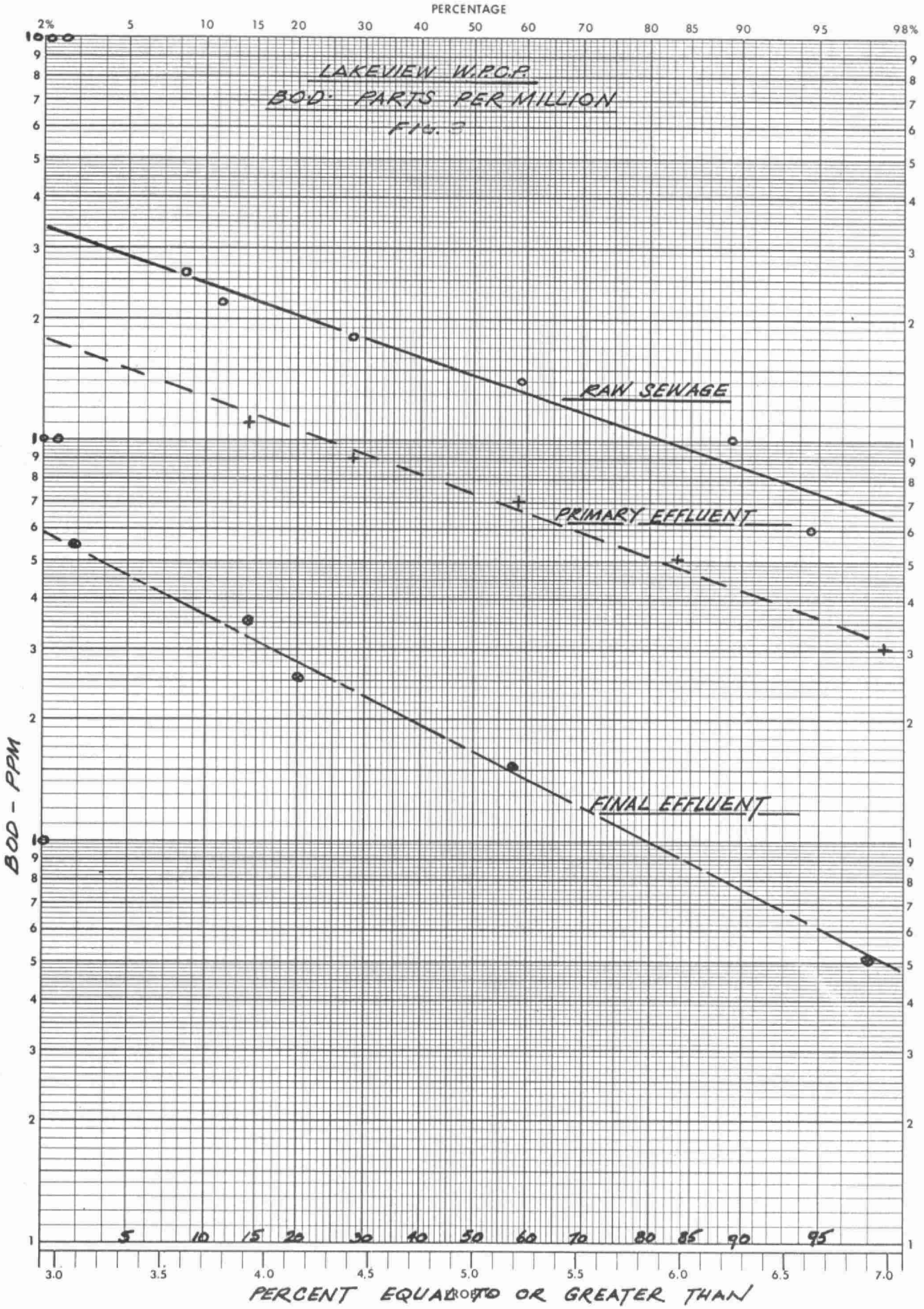
WEEK ENDING	FLOW				FLOW RATE	
	TOTAL FLOW M.G.	AV. DAILY FLOW MGD	MAX. DAILY FLOW MGD	MIN. DAILY FLOW MGD	MAX. MGD	MIN. MGD
Jan. 6	7.662	1.277	1.382	1.068		
13	8.889	1.270	1.739	1.103		
20	12.116	1.731	2.398	1.336		
27	11.325	1.618	1.723	1.388		
31	6.952	1.743	1.886	1.572	3.3	0.4
Feb. 3	5.247	1.743	1.830	1.535	3.3	0.4
10	12.650	1.807	2.480	1.424	3.4	0.9
17	10.909	1.557	1.793	1.298	3.2	0.5
24	10.176	1.454	2.231	1.111	3.9	0.5
[illegible]	7.189	1.737	2.097	1.279	4.4	0.9
Mar. [illegible]	4.971	1.737	1.735	1.589	2.6	0.7
10	11.605	1.658	1.802	1.450	4.3	0.6
17	15.690	2.240	2.628	1.394	5.4	0.2
24	13.121	1.874	2.103	1.647	3.2	1.0
31	12.698	1.814	1.990	1.370	3.5	1.1
Apr. 7	10.594	1.513	1.803	1.293	2.5	0.4
14	10.986	1.57	1.860	1.316	4.5	0.8
21	10.219	1.46	1.595	1.295	2.6	0.9
28	11.829	1.63	1.290	1.907	2.8	0.8
30	3.245	1.829	1.752	1.493	2.8	0.9
May 5	9.557	1.829	1.998	1.696	2.7	1.0
12	12.002	1.572	1.751	1.624	4.2	0.8
19	9.303	1.329	1.419	1.251	2.6	0.7
26	7.990	1.141	1.271	.979	3.5	0.6
31	6.392	1.252	1.395	1.042	3.3	0.7
June 2	2.374	1.252	1.288	1.086	3.7	0.7
9	10.191	1.456	1.686	.967	2.6	0.3
16	13.559	1.937	2.204	1.605	5.5	0.7
23	12.110	1.730	1.932	1.496	3.5	0.9
30	10.804	1.543	1.686	1.343	2.9	0.6
July 7	9.307	1.330	1.560	1.115	2.9	0.4
14	10.310	1.490	1.682	1.116	2.7	0.5
21	10.108	1.447	1.601	1.132	2.5	0.6
28	13.256	1.895	2.292	1.411	6.3	0.6
31	5.295	1.712	1.874	1.662	2.9	0.9

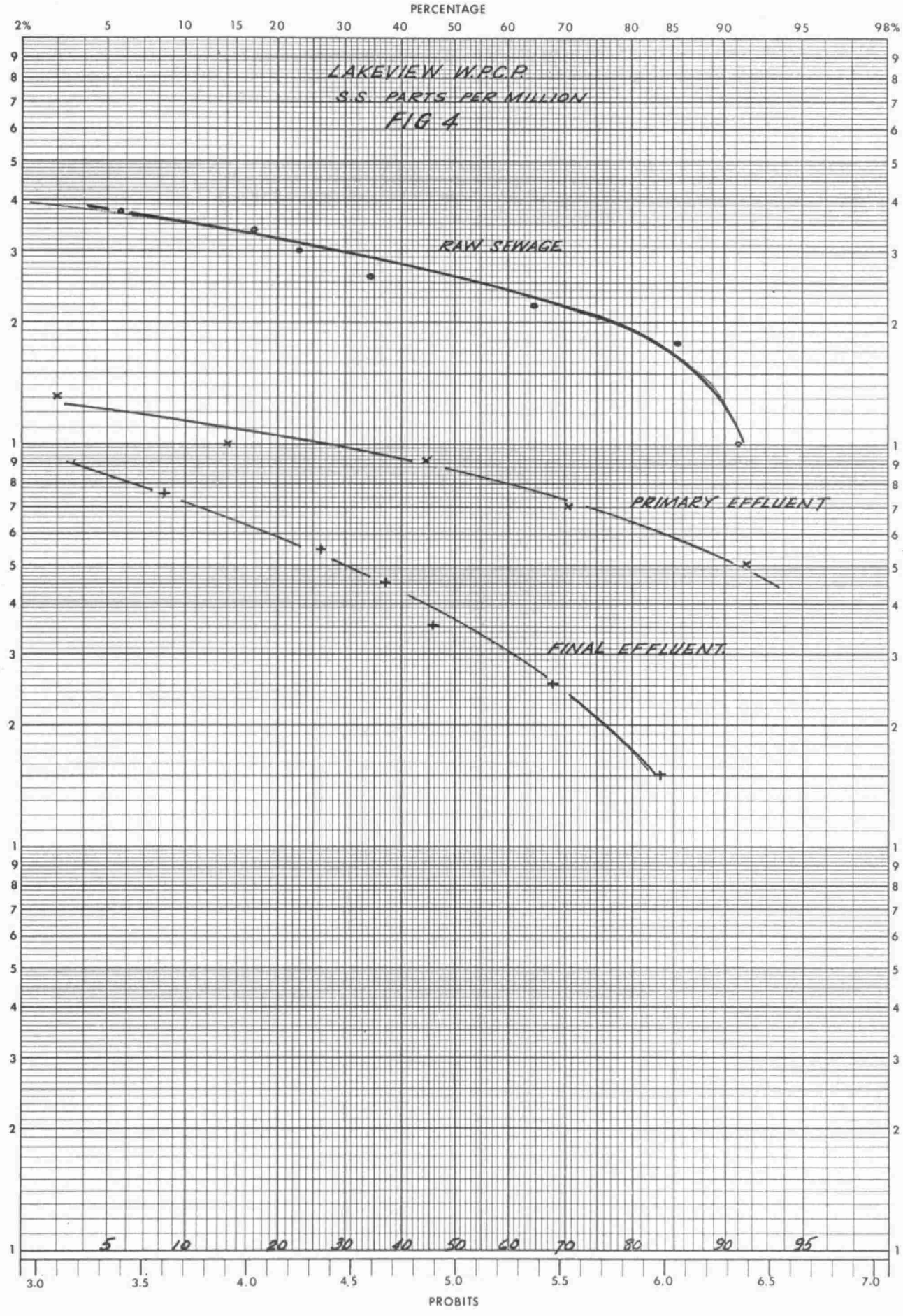
TABLE I CONT'D

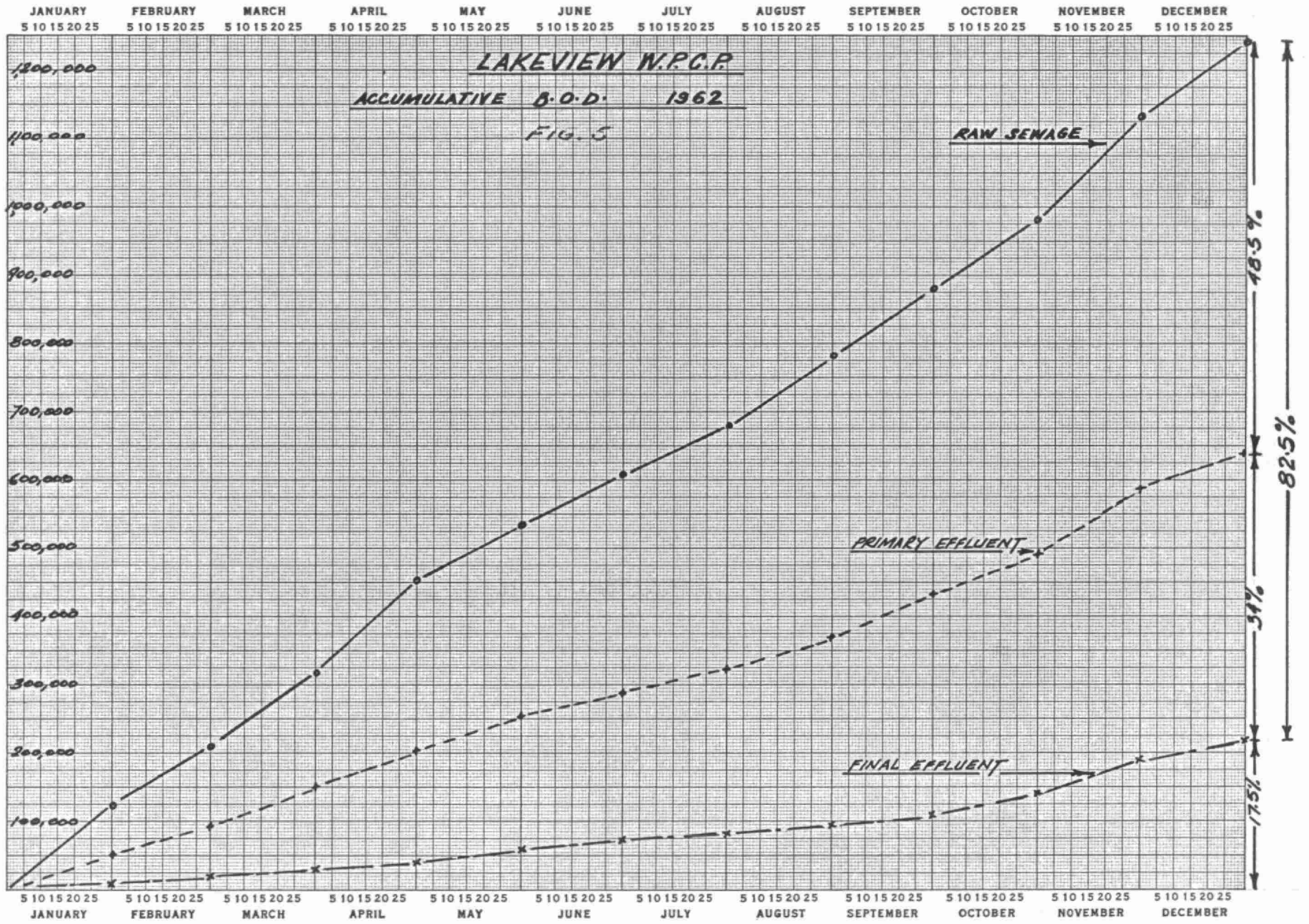
Lakeview Water Pollution Control Plant

	FLOW				FLOW RATE	
	TOTAL FLOW M.G.	AV. DAILY FLOW MGD	MAX. DAILY FLOW MGD	MIN. DAILY FLOW MGD	MAX. MGD	MIN. MGD
Aug. 4	6.697	1.712	1.786	1.500	3.0	1.0
11	12.016	1.706	2.1711	1.325	3.3	0.6
18	11.451	1.636	1.742	1.422	3.0	0.8
25	11.213	1.602	1.802	1.339	2.9	0.7
31	12.412	2.033	2.327	1.398	5.2	0.6
Sept. 1	1.816	2.033	1.816	1.816	2.5	1.0
8	12.565	1.795	1.987	1.514	3.1	0.8
15	12.407	1.773	2.095	1.468	3.8	0.7
22	14.379	2.054	2.439	1.341	5.0	0.7
30	18.081	2.587	4.448	1.850	6.2	0.9
	3.254	3.104	2.254	3.254	3.8	2.2
Oct. 6	18.476	3.104	3.453	2.682	5.0	1.5
13	19.285	2.755	2.964	2.442	2.964	2.442
20	17.256	2.465	2.643	2.305	2.643	2.305
27	21.475	3.068	3.926	2.508	3.926	2.508
31	11.463	2.787	2.974	2.675	2.974	2.675
Nov. 3	8.046	2.787	2.887	2.330	4.200	1.500
10	21.165	3.023	5.038	2.612	7.000	1.200
17	30.272	4.325	5.641	3.604	6.000	2.300
24	23.104	3.301	3.556	2.894	4.600	1.900
30	18.462	3.077	3.295	2.790	5.200	1.200
Dec. 1	3.147	3.147	3.147		4.800	2.000
8	24.748	3.536	5.026	2.791		
15	24.658	3.522	3.880	2.881	5.200	1.200
22	19.430	2.775	2.928	2.584	4.100	1.300
29	16.892	2.413	2.538	2.283	4.200	.800
31*	6.128	3.064				

*Prorated on previous MGD


LAKEVIEW W.P.C.P.
BOD: PARTS PER MILLION
FIG. 3
PERCENTAGE
2% 5 10 15 20 30 40 50 60 70 80 85 90 95 98%
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
BOD - PPM
5 10 15 20 30 40 50 60 70 80 85 90 95
3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0
PERCENT EQUAL TO OR GREATER THAN


PERCENTAGE
2%
5
10
15
20
30
40
50
60
70
80
85
90
95
98%
LAKEVIEW W.P.C.P.
S.S. PARTS PER MILLION
FIG 4
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
PROBITS
3.0
3.5
4.0
4.5
5.0
5.5
6.0
6.5
7.0


LAKEVIEW W.P.C.P.
ACCUMULATIVE B·O·D· 1962
FIG. 5
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
5 10 15 20 25
1,200,000
1,100,000
1,000,000
900,000
800,000
700,000
600,000
500,000
400,000
300,000
200,000
100,000
BOD - LBS
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
18·5%
82·5%
31%
17·5%

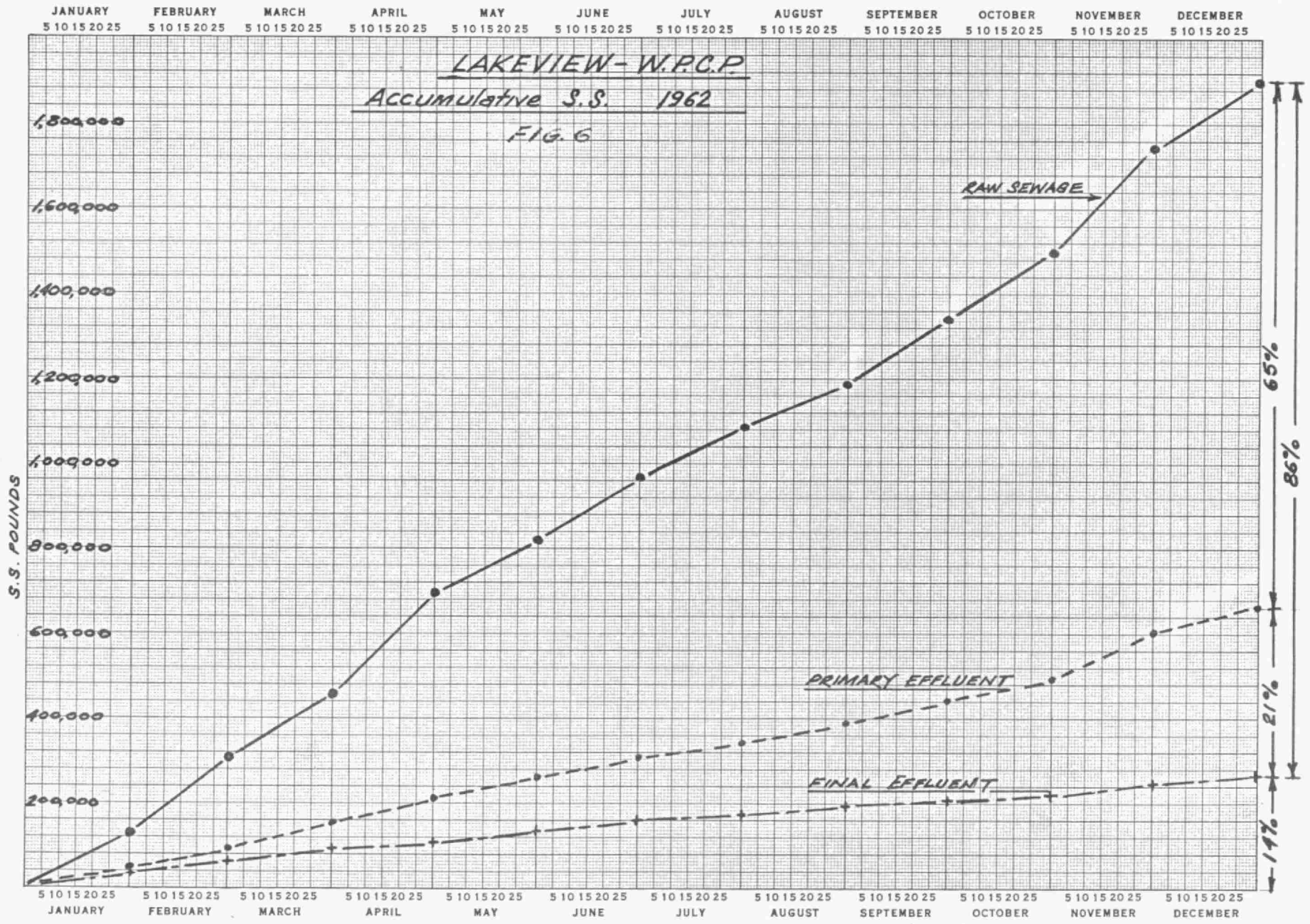

LAKEVIEW - W.P.C.P.
Accumulative S.S. 1962
FIG. 6
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
5 10 15 20 25
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
S.S. POUNDS
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
65%
86%
21%
14%

TABLE II

Lakeview Water Pollution Control Plant

B.O.D. Loading & Reduction

	RAW SEWAGE B.O.D.		PRIM. EFF.		PRIMARY REMOVAL		FINAL EFF.		TOTAL REMOVAL	
MONTH	PPM	LBS/DAY	PPM	LBS/DAY	LBS/DAY	%	PPM	LBS/DAY	LBS.	%
January	260	4000	110	1700	2300	58	23	355	3645	91
February	185	3050	87	1450	1600	52	20	330	2720	89
March	185	3440	100	1870	1570	45	18	338	3102	90
April	297	4600	118	1840	2760	60	19	296	4304	94
May	182	2260	104	1520	1140	43	46	670	1990	75
June	148	2420	73	1190	1230	51	29	470	1950	81
July	143	2220	67	1135	1085	49	15	234	1986	89
August	150	3050	76	1545	1505	49.5	21	427	2623	86
September	174	3550	96	2050	1500	42.5	24	500	3050	87
October	118	3350	66	1870	1480	44	35	990	2360	70
November	152	5130	96	3240	1890	37	50	1680	3450	67
December	111	3400	54	1660	1740	51	28	850	2550	75
AVERAGE	175.5		87.3				27.3			

TABLE III

Lakeview Water Pollution Control Plant

Suspended Solids Loading & Reduction

MONTH	RAW SEWAGE		PRIM. EFF.		PRIM. REMOVAL		FINAL EFF.		TOTAL REMOVAL	
	PPM	LBS/DAY	PPM	LBS/DAY	LBS/DAY	%	PPM	LBS/DAY	LBS/DAY	%
January	320	4350	118	1790	2560	60	69	1045	3305	76
February	377	6200	87	1440	4760	77	53	870	5330	86
March	271	5100	107	2000	3100	61	36	670	4430	87
April	487	7600	121	1900	5700	75	55	850	6750	88
May	256	3750	105	1540	2210	59	54	790	2960	79
June	297	4850	84	1370	3480	72	46	750	4100	85
July	259	4030	90	1400	2630	65	34	530	3500	87
August	194	3370	80	1380	1990	59	34	590	2780	82
September	250	5200	83	1740	3460	67	24	500	4700	90
October	168	4780	62	1760	3020	63	11	312	4468	93
November	242	8160	107	3610	4550	56	24	810	7350	90
December	166	5100	65	2000	3100	61	25	770	4330	85

(D) CHLORINATION

Chlorination of the final effluent is carried out continuously throughout the year. A total of 38,607 pounds of chlorine was required to treat 740 million gallons of raw sewage. This represents an average chlorine dosage of 5.2 ppm.

The chlorine is introduced into the effluent pipe which provides for a contact period of 50 minutes at design flow.

A monthly table of chlorine consumption is included with this report - see Table IV.

(E) SLUDGE DISPOSAL

Sludge disposal at this plant is by contract. The digested sludge is withdrawn from the secondary digester and hauled away for disposal by means of a tank truck. There are no sludge drying facilities at this plant.

(F) PLANT SUPERVISION

The plant receives 24 hour supervision under the direction of Mr. Ken Stratton, the Plant's Chief Operator.

Daily laboratory tests are carried out under Mr. Stratton's supervision in order to control the process. Routine samples are also collected and submitted to the OWRC laboratory for analysis. Mr. Stratton is also responsible for maintaining all the equipment, grounds, and buildings.

The operation of the project is under the supervision of the Division of Plant Operations. During the year, approximately 20 visits were made by the head office project engineer, 6 visits by head office electronics staff and 3 visits by head office

LAKEVIEW WATER POLLUTION CONTROL PLANT
CHLORINATION DATA

MONTH	CHLORINE USED	FLOW(MG)	DOSAGE(PPM)
January	*--	46.944	----
February	2760	46.171	5.7
March	3476	58.085	5.9
April	2958	46.873	6.1
May	2759	45.244	6.5
June	2899	49.038	5.9
July	2704	48.276	5.6
August	3462	53.789	6.3
September	4359	62.502	6.9
October	4796	87.955	5.5
November	4860	101.049	4.8
December	3574	95.003	3.7
TOTAL:	38607	**693.985	5.5

* Data unreliable for January.

** January's flow not included.

maintenance staff. In addition, approximately 165 purchase orders were processed during the year by the head office staff.

V COST DATA

(A) CAPITAL COST

The Capital Cost of this project including interest was $ 1,883,644.00.

(B) RESERVE FOR CONTINGENCIES

As of December 31, 1962 there was a total of $ 4,733 in the reserve fund. The money in this fund is to be used in case of emergency or major repairs.

The money in the reserve fund is invested by the Government and earns interest at a rate of approximately 5¼ percent per annum.

(C) OPERATING COST

The following is the operating costs for the year 1962 together with actual expenditures. A more detailed breakdown of costs may be found in Table V.

ITEM	BUDGET	EXPENDITURE
Payroll		$ 34,696.65
Superannuation		
Fuel		2,527.72
Power		8,274.61
Chemicals		7,990.16
General Supplies		3,422.97
Equipment		896.93
Maintenance & Repairs		359.03

ITEM	BUDGET	EXPENDITURE
Sludge Haulage		$ 4,385.44
Water		2,798.74
Sundry		8,645.36
Contingency		
TOTAL:		$ 73,997.61

UNIT OPERATING COSTS

- per pound B.O.D. removed	7.4 ¢
- per pound S.S. removed	4.5 ¢
- per million gallons treated	$100.00
- per capita (50,000 pop.)	$ 1.98

(D) TOTAL COSTS

The total cost to the municipality in 1962 was as follows :

Operating	$ 73,997.61
Debt Retirement *	36,145.02
Reserve	4,733.36
TOTAL	$114,875.99

* includes interest

On the basis of a population of 50,000 the total annual cost of the Lakeview Water Pollution Control Plant was $ 2.30 per person.

LAKEVIEW WATER POLLUTION CONTROL PLANT
OPERATING COSTS

MONTH	EXPENDITURE	PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINT.	SUNDRY	WATER
Jan.	3263.29	2621.71			47.10	273.25	15.40	15.45	295.38	
Feb.	5391.84	2591.92		857.50	216.30	141.88	449.18		123.01	1012.05
Mar.	5461.63	2632.14	317.10	669.51		635.64	198.76	9.17	374.17	625.14
Apr.	5475.52	2591.92	712.08	654.56	1102.03	140.20			103.77	170.96
May	5387.00	2623.50	944.86	663.52	270.24	311.31	59.00	132.50	158.06	224.01
June	3860.96	2709.84	215.95	654.56	*233.70	302.20	72.10		117.62	222.39
July	11915.55	2685.66	39.17	669.42	1171.76	462.33		41.32	6639.56	206.33
Aug.	5803.73	4028.49	89.83	651.00	712.89	50.08		4.92	136.47	130.05
Sept.	5197.74	2685.66	79.99	949.62	968.98	138.14		32.22	247.19	95.94
Oct.	5529.75	2685.66	189.62	802.09	51.66	124.60			1676.12	
Nov.	5840.28	2685.66	152.70	936.49	270.45	295.74	102.49	97.63	1263.12	36.00
Dec.	10865.32	4154.49	*13.58	766.34	3412.45	547.60		25.82	1896.33	75.87
TOTAL:	73997.61	34696.65	2527.72	8274.61	7990.16	3422.97	896.93	359.03	13030.80	2798.74

* Credit